Comparison of key skills specifications 2000/2002 with 2004 standardsX015461July 2004Issue 1



**Mark Scheme (Results)**

Summer 2018

Pearson Edexcel International GCSE

In Mathematics A (4MA1) Paper 1H

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**General Marking Guidance**

* All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
* Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
* Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
* There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
* All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.

Examiners should also be prepared to award zero marks if the candidate’s response is not worthy of credit according to the mark scheme.

* Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
* When examiners are in doubt regarding the application of the mark scheme to a candidate’s response, the team leader must be consulted.
* Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
* **Types of mark**
  + M marks: method marks
  + A marks: accuracy marks
  + B marks: unconditional accuracy marks (independent of M marks)
* **Abbreviations**
  + cao – correct answer only
  + ft – follow through
  + isw – ignore subsequent working
  + SC - special case
  + oe – or equivalent (and appropriate)
  + dep – dependent
  + indep – independent
  + eeoo – each error or omission
* **No working**

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.

* **With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

If there is no answer on the answer line then check the working for an obvious answer.

* **Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

* **Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part ofthe question CANNOT be awarded in another.

| **International GCSE Maths 4MA1 1H** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Apart from questions 3c, 11b and 20 (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method. | | | | | | |
| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| 1 | a |  | 0 < *p* ≤ 1 | 1 | B1 |  |
|  | b | 0.5 × 19 + 1.5 × 12 + 2.5 × 5 + 3.5 × 2 + 4.5 × 2 (=56) **or** 9.5 + 18 + 12.5 + 7 + 9 (=56) | 1.4 | 4 | M2 | for at least 4 correct products added (need not be evaluated)  If not M2 then award  M1 for consistent use of value within interval (including end points) for at least 4 products which must be added  **OR**  correct mid-points used for at least 4 products and not added |
|  |  | “56” ÷ 40 | M1 | dep on at least M1  Allow division by their  provided addition or total under column seen |
|  |  |  | A1 | for 1.4 or |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 2 |  | 170 ÷ 2 (=85) **or** 170 ÷ 2 × 7 (=595) **or** 7 ÷ 2 (=3.5) | 510 | 5 | M1 |  |
|  |  | 7 × “85” + 170 (=765) **or** 9 × “85” (=765) **or** “595” + 170 (=765) **or** 170 × “3.5” + 170 (=765) |  |  | M1 | award of this mark implies the first M1 |
|  |  | “765” ÷ 3 (=255) **or**  "765" ÷ 3 × 5 (=1275) |  |  | M1 | dep on M2 |
|  |  | “255” × 2 **or** “1275” – “765” **or**  “1275” ÷ 5 × 2 |  |  | M1 |  |
|  |  |  |  |  | A1 |  |
|  |  | **Alternative scheme** |  |  |  |  |
| 2 |  | (girls = )  (of children) | 510 | 5 | M1 |  |
|  |  | (girls = )  (of total)  **or** G : C : A = |  |  | M1 | award of this mark implies the first M1 |
|  |  | (=1275) **or** G : A = 2 : 6 oe |  |  | M1 | dep on M2 |
|  |  | “1275” ÷ 5 × 2 **or** 3 × 170 |  |  | M1 |  |
|  |  |  |  |  | A1 |  |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 3 | a |  | *y*14 | 1 | B1 |  |
|  | b |  | 16*m*12 | 2 | B2 | if not B2 then  B1 for *am*12 **or** 16*mb* **or** 24*m*12 *b* ≠ 0, 12 *a* ≠ 1, 16 |
|  | c | 5*x* + 15 = 3*x* – 4 **or** *x* + 3 = | oe | 3 | M1 | for removing bracket in a correct equation or dividing all terms by 5 in a correct equation |
|  |  | e.g. 5*x* – 3*x* = −4 – 15 | M1 | ft from *ax* + *b* = *cx* + *d* for correctly isolating terms in *x* on one side of equation and constant terms on the other side |
|  |  |  | A1 | dep on at least M1 |
|  | d (i) |  | (*x* – 4)(*x* + 6) | 2 | M1 | for (*x* + *a*)(*x* + *b*) where either *ab* = −24 **or** *a* + *b* = +2  e.g (*x* – 6)(*x* + 4) |
|  |  |  |  |  |
|  |  |  | A1 |  |
|  | (ii) |  | 4, − 6 | 1 | B1 | cao **or** ft from any (*x* + *p*)(*x* + *q*) |
| 4 | a (i) |  | 1, 2, 3, 4, 6, 12 | 1 | B1 | cao |
|  | (ii) |  | 1, 3, 5, 7, 9, 10, 11 | 1 | B1 | cao |
|  | b |  | Yes with reason | 1 | B1 | e.g. no numbers in both *A* and *C* **or** *A* and *C* do not intersect **or** *A* and *C* do not overlap **or** *A* and *C* are mutually exclusive |
|  | c |  | oe | 2 | M1 | for 12 – 2 (=10) **or**  with *a* < 12 **or**  10 and 12 used with incorrect notation E.g. 10 : 12 |
|  |  |  | A1 | for oe **or** 0.83(3…) **or** 83(.3..)% |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | a |  | 80 000 | 1 | B1 |  | |
|  | b | 0.5 × 105 – 8  **or**  0.0005 **or** 5 × 10*n***or** 5.0 × 10*n* | 5 × 10-4 | 2 | M1 |  | |
|  |  |  |  | A1 | for 5 × 10-4 or 5.0 × 10-4  SC : B1 for  **or** | |
| 6 |  | 9.72 + 3.52 (=106.34) | 32.4 | 4 | M1 |  | M1 for the use of *MN* and a correct angle (70.1… or 70.2, 19.8…) in a correct trig statement  eg cos70.2= |
|  |  | or  (=10.3…) |  |  | M1 |  | M1 for a complete method to find *MN*  eg *MN*=(=10.3…) |
|  |  | π × “10.3…” **or** 2 × π × |  |  | M1 | dep on M2 | |
|  |  |  |  |  | A1 | for answer in range 32.3 – 32.41 | |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | a | × 160 000 oe (=6400) | 141 558 | 3 | M1 |  | M2 for 160 000 × 0.963  **or** 160 000 × 0.964  (=135 895.44..))  If not M2 then award  M1 for 160 000 ×0 .96  **(=**153 600)  **or** 160 000 × 0.962  (=147 456) |
|  |  | × (160 000 – “6400”) (= 6144)  × (160 000 – “6400” – “6144”) (= 5898.24) 160 000 – “6400” – “6144” − “5898.24” |  |  | M1 | for a complete  method (condone 4 years rather than 3) |
|  |  |  |  |  |  | accept (1 – 0.04) in place of 0.96 throughout | |
|  |  |  |  |  | A1 | for 141 557.76 - 141 558  **SC** If no other marks gained, award  B1 for 160 000 × 0.12 oe (=19 200)  **or** 160 000 × 0.88 oe (=140 800)  **or** an answer of 140 800  **or** an answer of in the range 179 978 – 179 978.24 | |
|  | b | E.g. 252 000 ÷ 1.05 | 240 000 | 3 | M2 | If not M2  then M1 for  *x* × 1.05 = 252 000 **or**  252 000 ÷ 105 oe | |
|  |  |  |  |  | A1 | NB: An answer of 239 400 scores M0 M0 A0 | |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 8 | a (i) |  | 3 × 73 | 1 | B1 | for 3 × 73 oe **or** 1029 |
|  | (ii) |  | 23 × 35 × 5 × 74 | 1 | B1 | for 23 × 35 × 5 × 74 oe **or** 23 337 720 |
|  | b |  | 4, 2, 1 | 2 | M1 | for *r* = 1  **or** for *p* = 4 **and** *q* = 2  **or** correct representation of *C* in terms of prime factors on a Venn diagram |
|  |  |  |  |  | A1 |  |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 9 |  | E.g. **or  or**  **or** | 110 | 5 | M1 | substitutes correctly into a trig ratio  (including the Sine rule) |
|  |  | E.g.(shortest side) =  **or** 12.8tan(90 – 72) **or** 4.15(89…) **or** 4.16 **or** (hypotenuse = )  **or**  **or**  13.4(58…) **or** 13.5 | M1 | for a complete method to find one side of the triangle |
|  |  | **One of** (shortest side = ) **or** 12.8tan(90 – 72) **or** 4.15(89…) **or** 4.16 **or**  **AND** **One of** (hypotenuse = )  **or**  **or**  13.4(58…) **or** 13.5 **or** | M1 | for a complete method to find both missing sides of triangle  NB Could use Pythagoras’s theorem with side found – must be a complete correct method |
|  |  | 5 × (“13.4(58…)” – “4.15(89…)” ) + 5 × 12.8 **or** 5 × (“13.4…” + “4.15…” + 12.8) – 10 × “4.15…” | M1 | for method to use found lengths to find perimeter |
|  |  |  | A1 | for answer in range 110 - 111 |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 10 | a | Readings from graph at cf 20 and cf 60 eg. readings of 103 and 123 | 20.5 | 2 | M1  A1 |  |
|  |  |  | for answer in range 19 – 21 |
|  | b | Reading from graph from time = 120 (=55)**or** 80 – 55 (=25) | No with correct figures | 3 | M1 | accept reading in range 55 – 56 |
|  |  | 0.35 × 80 (=28) **or**  e.g.  oe (=31(.25)) **or**  oe (= 68(.75)) | M1 | accept a value in the range 30 – 31.25 **or** a value in the range 68 – 70 for this mark unless clearly from incorrect working |
|  |  |  | A1 | eg. No with 28 and 25  **or**  No with 31.25%  (accept value in range 30% – 31.25%) **or**  No with 68.75% and 65%  (accept value in range 68% – 70%) |
|  |  | **Alternative scheme** |  |  |  |  |
|  |  | 0.65 × 80 (=52) | No with correct figures | 3 | M1 |  |
|  |  | Reading from graph from cf = 52 (=118) **or**Reading from graph from time = 120 (=55) |  |  | M1 | accept reading in range 55 – 56 |
|  |  |  |  |  | A1 | eg. No with 118 (minutes)  **or**  No with 52 and 55 |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 11 | a | 2*x*2 – *x* + 6*x* – 3 **or** 2*x*2 + 5*x* – 3 **or**  *x*2 + 3*x* – 5*x* – 15 **or** *x*2 – 2*x* – 15 **or**  2*x*2 – 10*x* – *x* + 5 **or** 2*x*2 – 11*x* + 5 | 2*x*3 – 5*x*2 – 28*x* + 15 | 3 | M1 | for expansion of any 2 of the 3 brackets (at least 3 of 4 terms correct) |
|  |  | eg.  2*x*3 + 5*x*2 – 3*x* – 10*x*2 – 25*x* + 15 **or**  2*x*3 – 4*x*2 – 30*x* –*x*2 + 2*x* + 15 **or**  2*x*3 – 11*x*2 + 5*x* + 6*x*2 – 33*x* + 15 |  |  | M1 | (dep) ft for at least half of their terms correct in second expansion (the correct number of terms **must** be present) |
|  |  |  |  |  | A1 |  |
|  |  | **Alternative scheme** |  |  |  |  |
|  |  | 2*x*3 – 10*x*2 – *x*2 + 5*x* + 6*x*2 – 30*x* – 3*x* + 15 | 2*x*3 – 5*x*2 – 28*x* + 15 | 3 | M2 | for a complete expansion with 8 terms present, at least 4 of which must be correct |
|  |  |  |  |  | A1 |  |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 11 | b | Accept 9.79 – 9.8(0) in place of  NB: denominator must be 2 × 3 or 6 **and** there must be evidence for correct order of operations in the numerator | 0.633, −2.63 | 3 | M2 | If not M2 then award M1 for    condone one sign error in substitution;  allow evaluation of individual terms e.g 36 in place of 62 |
|  |  |  |  |  | A1 | dep on M1 for answers in range  0.63 to 0.633 , −2.63 to −2.633  Award M2A1 for correct answer with correct working that would gain at least M1 |
|  |  | **Alternative scheme** |  |  |  |  |
|  |  | e.g 3((*x* + 1)2 – 1) – 5 (= 0) **or** | 0.633, −2.63 | 3 | M1 | for completing the square |
|  |  | (*x* = )  oe |  |  | M1 | for correct method to isolate *x* |
|  |  |  |  |  | A1 | dep on M1 for answer in range  0.63 to 0.633 , −2.63 to −2.633  Award M2A1 for correct answer with correct working that would gain at least M1 |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 12 | (a) |  | 3, 4 | 1 | B1 |  |
|  | (b) |  | see graph at end of mark scheme | 3 | B3 | for correct region identified |
|  |  |  |  |  |  | If not B3 then award  B2 for *x* + *y* = 4 drawn (with no additional lines drawn) **and** a region identified that satisfies at least 3 of the 5 given inequalities |
|  |  |  |  |  |  | If not B2 then award  B1 for line *x* + *y* = 4 drawn  NB. May shade wanted or unwanted regions; lines may be solid or dashed |
| 13 | a (i) |  | 54 | 1 | B1 | cao |
|  | (ii) |  | angle at centre is twice angle at circumference | 1 | B1 | dep on B1 in (a)(i) accept alternative reasons  eg. angle at circumference is half the angle at the centre |
|  | b (i) |  | 27 | 1 | B1 | ft from (a)(i) for |
|  | (ii) |  | alternate segment theorem | 1 | B1 | dep on B1 in (b)(i) accept alternative reason  angle between tangent and radius is 90o  If answer for (b)(i) is ft from (a)(i) then reason must be  angle between tangent and radius is 90o |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 15 | a | E.g.  **or**  **or**  **or**  **or**  **or**  with 2 of *k* = oe , *a* = 2, *b* = 5  **or**  with 2 of *m* = 4, *a* = 2, *b* = 5 |  | 2 | M1 | for a correct first step leading to a correct partially simplified expression |
|  |  |  |  |  | A1 | for  **or** **or**  **or** 0.25*y*2*x*-5 |
|  | b |  |  | 3 | M1 | indep for (3*x* + 5)(3*x* – 5) |
|  |  | E.g. **or** |  |  | M1 | for two correct fractions with a common denominator  if there is any expansion at this stage then it must be correct |
|  |  |  |  |  | A1 | accept equivalents eg. |
|  |  | **Alternative scheme** |  |  |  |  |
|  |  |  |  | 3 | M1 | for two correct fractions with a common denominator |
|  |  |  |  |  |  |  |
|  |  |  |  |  | M1 | Numerator expanded and then factorised correctly |
|  |  |  |  |  | A1 | accept equivalents |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 16 |  | **or** 0.216 **or** 125 – 98 (=27) | oe | 4 | M1 |  |
|  |  | **or** | M1 | for the length scale factor  may be seen as a ratio E.g. 3 : 5 |
|  |  | **or** *h* −  oe | M1 |  |
|  |  |  | A1 | for  oe (may not be simplified) |
|  |  | **Alternative scheme** |  |  |  |  |
|  |  | =  oe | oe | 4 | M1 | sets up an equation using scale factor |
|  |  | *k* = |  | M1 | for the length scale factor |
|  |  | **or** *h* −  oe |  | M1 |  |
|  |  |  |  | A1 | for  oe (may not be simplified) |

| Question | | **Working** | **Answer** | **Mark** | **Notes** | |
| --- | --- | --- | --- | --- | --- | --- |
| 19 |  | **or** **or**  **or** | oe | 4 | M1 | for any one correct probability |
|  |  | **or** | M1 | for a complete method |
|  |  | **or** | M1 |  |
|  |  |  | A1 | for  oe **or** 0.3025 **or**  30.25% |

**Question 12**

1

2

3

4

5

6

7

8

9

10

-1

-2

1

2

3

4

5

6

7

8

9

10

-1

-2

0

*x*

*y*

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